

## **Protecting Human Health and the Environment on Sioux Tribal Lands: A Partnership of EPA and Tribal EPD**

John M. Johnston  
Research Ecologist  
ORD/NERL/ERD  
(706) 355-8153  
johnston.johnm@epa.gov

**Authors:** John Johnston, Dale Hoff (EPA Region VIII), Chris Knightes (ORD/NERL), Robert Ambrose (ORD/NERL), Carlyle Ducheneaux (CRST) and Roger Hoogerheide (EPA Region VIII)

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Through environmental sampling performed by EPA and Cheyenne River Sioux Tribe Environmental Protection Division personnel, mercury contamination in managed pond systems in South Dakota was characterized and risk reduction recommendations were made to protect subsistence fisherman and their families. However, scientific uncertainty remains with regard to the mechanisms of methylation and demethylation within the pond systems, as well as the means of mitigating the biomagnification occurring in aquatic food webs across the region. In a previous model evaluation of the Regional Mercury Cycling Model (R-MCM), it was discovered that models based on the current science underpredict both total mercury concentrations as well as the percent of total mercury present as methylmercury. This suggests that current models are not adequately capturing the processes governing the total loading of mercury to the system or the transformation processes governing methylmercury production. Continued monitoring of managed farm ponds is focused on reducing temporal and spatial uncertainty in model predictions, as well as uncertainty associated with model parameters such as mercury loading (atmospheric and watershed-based) and transformation. To address these key areas of scientific uncertainty, a model comparison is also underway, involving a new Excel spreadsheet-based application based on the Mercury Report to Congress.